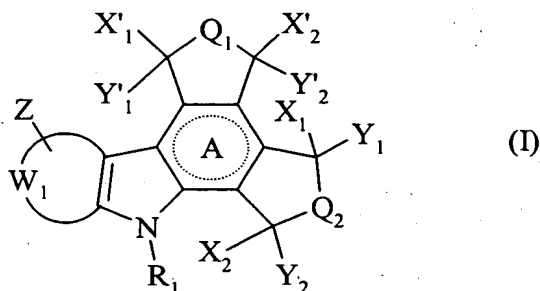


# CLAIMS

I-A compound selected from those of formula (I) :



wherein :

- A represents a saturated or partially or fully unsaturated ring, wherein the unsaturation optionally confers an aromatic nature on the ring,
- W<sub>1</sub>, together with the carbon atoms to which it is bonded, represents phenyl or pyridyl,
- Z represents one or more identical or different groups of formula U-V wherein :
  - ✓ U represents single bond, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkylene, linear or branched (C<sub>2</sub>-C<sub>6</sub>)alkenyl optionally substituted by one or more identical or different groups selected from halogen and hydroxy, and/or optionally containing one or more unsaturated bonds,
  - ✓ V represents a group selected from hydrogen, halogen, cyano, nitro, azido, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl, aryl, aryl-(C<sub>1</sub>-C<sub>6</sub>)alkyl in which the alkyl moiety may be linear or branched, hydroxy, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkoxy, aryloxy, aryl-(C<sub>1</sub>-C<sub>6</sub>)alkoxy in which the alkoxy moiety may be linear or branched, formyl, carboxy, aminocarbonyl, NR<sub>3</sub>R<sub>4</sub>, -C(O)-T<sub>1</sub>, -C(O)-NR<sub>3</sub>-T<sub>1</sub>, -NR<sub>3</sub>-C(O)-T<sub>1</sub>, -O-C(O)-T<sub>1</sub>, -C(O)-O-T<sub>1</sub>, -NR<sub>3</sub>-T<sub>2</sub>-NR<sub>3</sub>R<sub>4</sub>, -NR<sub>3</sub>-T<sub>2</sub>-OR<sub>3</sub>, -NR<sub>3</sub>-T<sub>2</sub>-CO<sub>2</sub>R<sub>3</sub>, -O-T'<sub>2</sub>-NR<sub>3</sub>R<sub>4</sub>, -O-T'<sub>2</sub>-OR<sub>3</sub>, -O-T'<sub>2</sub>-CO<sub>2</sub>R<sub>3</sub>, and -S(O)<sub>1</sub>-R<sub>3</sub>,

wherein :

- ⇒ R<sub>3</sub> and R<sub>4</sub>, which may be identical or different, each represents a group selected from hydrogen, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl, aryl, and aryl-(C<sub>1</sub>-C<sub>6</sub>)alkyl in which the alkyl moiety may be linear or branched, or

$R_3+R_4$ , with the nitrogen atom carrying them, together form a saturated monocyclic or bicyclic heterocycle that has from 5 to 10 ring atoms, optionally contains in the ring system a second hetero atom selected from oxygen and nitrogen, and is optionally substituted by a group selected from linear or branched  $(C_1-C_6)$ alkyl, aryl, aryl- $(C_1-C_6)$ alkyl in which the alkyl moiety may be linear or branched, hydroxy, linear or branched  $(C_1-C_6)$ alkoxy, amino, linear or branched mono- $(C_1-C_6)$ alkylamino, and di- $(C_1-C_6)$ alkylamino in which the alkyl moieties may be linear or branched,

⇒  $T_1$  represents a group selected from linear or branched  $(C_1-C_6)$ alkyl that is optionally substituted by a group selected from  $-OR_3$ ,  $-NR_3R_4$ ,  $-CO_2R_3$ ,  $-C(O)R_3$  and  $-C(O)NR_3R_4$  wherein  $R_3$  and  $R_4$  are as defined hereinbefore; aryl, and aryl- $(C_1-C_6)$ alkyl in which the alkyl moiety may be linear or branched; or  $T_1$  represents linear or branched  $(C_2-C_6)$ alkenyl optionally substituted by a group selected from  $-OR_3$ ,  $-NR_3R_4$ ,  $-CO_2R_3$ ,  $-C(O)R_3$  and  $-C(O)NR_3R_4$  wherein  $R_3$  and  $R_4$  are as defined hereinbefore,

⇒  $T_2$  represents linear or branched  $(C_1-C_6)$ alkylene,

⇒  $T'_2$  represents or a linear or branched  $(C_1-C_6)$ alkylene optionally substituted with one or more hydroxy groups,

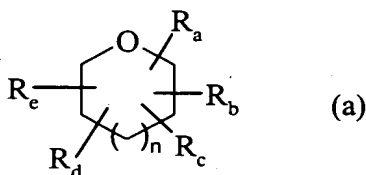
⇒  $t$  represents integer of from 0 to 2 inclusive,

or  $Z$  represents methylenedioxy or ethylenedioxy,

- $Q_1$  represents a group selected from oxygen,  $NR_2$  wherein  $R_2$  represents a group selected from hydrogen, linear or branched  $(C_1-C_6)$ alkyl, aryl, aryl- $(C_1-C_6)$ alkyl in which the alkyl moiety may be linear or branched, cycloalkyl, cycloalkyl- $(C_1-C_6)$ alkyl in which the alkyl moiety may be linear or branched,  $-OR_3$ ,  $-NR_3R_4$ ,  $-O-T_2-NR_3R_4$ ,  $-NR_3-T_2-NR_3R_4$ , linear or branched  $(C_1-C_6)$ hydroxyalkylamino, di- $((C_1-C_6)$ hydroxyalkyl)amino in which the alkyl moieties may be linear or branched,  $-C(O)-R_3$  and  $-NH-C(O)-R_3$ ; or  $R_2$  represents linear or branched  $(C_1-C_6)$ alkylene substituted by one or more identical or different groups selected from halogen, cyano, nitro,  $-OR_3$ ,  $-NR_3R_4$ ,  $-CO_2R_3$ ,  $-C(O)R_3$ , linear or branched  $(C_1-C_6)$ hydroxyalkylamino, di- $((C_1-C_6)$ hydroxyalkyl)amino in which the alkyl moieties may be linear or branched, and  $-C(O)-NHR_3$ ,  $R_3$ ,  $R_4$  and  $T_2$  being as defined hereinbefore,

- $Q_2$  represents a group selected from oxygen,  $NR'_2$  wherein  $R'_2$  represents a group selected from hydrogen, linear or branched  $(C_1-C_6)$ alkyl, aryl, aryl- $(C_1-C_6)$ alkyl in which the alkyl moiety may be linear or branched, cycloalkyl, cycloalkyl- $(C_1-C_6)$ alkyl in which the alkyl moiety may be linear or branched,  $-OR_3$ ,  $-NR_3R_4$ ,  $-O-T_2-NR_3R_4$ ,  $-NR_3-T_2-NR_3R_4$ , linear or branched  $(C_1-C_6)$ hydroxyalkylamino, di- $((C_1-C_6)$ hydroxyalkyl)amino in which the alkyl moieties may be linear or branched,  $-C(O)-R_3$  and  $-NH-C(O)-R_3$ ; or  $R'_2$  represents a linear or branched  $(C_1-C_6)$ alkylene substituted by one or more identical or different groups selected from halogen, cyano, nitro,  $-OR_3$ ,  $-NR_3R_4$ ,  $-CO_2R_3$ ,  $-C(O)R_3$ , linear or branched  $(C_1-C_6)$ hydroxyalkylamino, di- $((C_1-C_6)$ hydroxyalkyl)amino in which the alkyl moieties may be linear or branched, and  $-C(O)-NHR_3$ ,  $R_3$ ,  $R_4$  and  $T_2$  being as defined hereinbefore,
- $X_1$  represents a group selected from hydrogen, hydroxy, linear or branched  $(C_1-C_6)$ alkoxy, mercapto, and linear or branched  $(C_1-C_6)$ alkylthio,
- $Y_1$  represents hydrogen, or
- $X_1$  and  $Y_1$ , with carbon carrying them, together form carbonyl or thiocarbonyl,
- $X_2$  represents a group selected from hydrogen, hydroxy, linear or branched  $(C_1-C_6)$ alkoxy, mercapto and linear or branched  $(C_1-C_6)$ alkylthio,
- $Y_2$  represents hydrogen, or
- $X_2$  and  $Y_2$ , with carbon carrying them, together form carbonyl or thiocarbonyl,
- $X'_1$  represents a group selected from hydrogen, hydroxy, linear or branched  $(C_1-C_6)$ alkoxy, mercapto and linear or branched  $(C_1-C_6)$ alkylthio,
- $Y'_1$  represents hydrogen, or
- $X'_1$  and  $Y'_1$ , with carbon carrying them, together form carbonyl or thiocarbonyl,
- $X'_2$  represents a group selected from hydrogen, hydroxy, linear or branched  $(C_1-C_6)$ alkoxy, mercapto and linear or branched  $(C_1-C_6)$ alkylthio,
- $Y'_2$  represents hydrogen, or
- $X'_2$  and  $Y'_2$ , with carbon carrying them, together form carbonyl or thiocarbonyl,

- **R<sub>1</sub>** represents a group selected from hydrogen, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl that is optionally substituted by one or more groups selected from hydroxy, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkoxy, linear or branched (C<sub>1</sub>-C<sub>6</sub>)hydroxyalkoxy or NR<sub>3</sub>R<sub>4</sub>, the groups R<sub>3</sub> and R<sub>4</sub> being as defined hereinbefore ; or R<sub>1</sub> represents a group of formula (a) :



wherein :

- ✓ **R<sub>a</sub>, R<sub>b</sub>, R<sub>c</sub> and R<sub>d</sub>**, which may be identical or different, each represents, independently of the others, a bond or a group selected from hydrogen, halogen, hydroxy, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkoxy, aryloxy, aryl-(C<sub>1</sub>-C<sub>6</sub>)alkoxy in which the alkoxy moiety may be linear or branched, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl, aryl-(C<sub>1</sub>-C<sub>6</sub>)alkyl in which the alkyl moiety may be linear or branched, aryl, -NR<sub>3</sub>R<sub>4</sub> wherein R<sub>3</sub> and R<sub>4</sub> are as defined hereinbefore, azido, -N=NR<sub>3</sub> (wherein R<sub>3</sub> is as defined hereinbefore), -O-C(O)-R<sub>5</sub> wherein R<sub>5</sub> represents linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl (optionally substituted by one or more groups selected from halogen, hydroxy, amino, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkylamino, and di(C<sub>1</sub>-C<sub>6</sub>)alkylamino in which the alkyl moieties may be linear or branched); or R<sub>5</sub> represents aryl, aryl-(C<sub>1</sub>-C<sub>6</sub>)alkyl in which the alkyl moiety may be linear or branched, cycloalkyl or heterocycloalkyl,
- ✓ **R<sub>e</sub>** represents methylene (H<sub>2</sub>C=) or a group of formula -U<sub>1</sub>-R<sub>a</sub> wherein U<sub>1</sub> represents single bond, methylene and R<sub>a</sub> is as defined hereinbefore,
- ✓ **n** is 0 or 1,

it being understood that the group of formula (a) is bonded to the nitrogen atom by R<sub>a</sub>, R<sub>b</sub>, R<sub>c</sub>, R<sub>d</sub> or R<sub>e</sub>,

its enantiomers, diastereoisomers, and addition salts thereof with a pharmaceutically acceptable acid or base,

with the proviso that the compound may not be :

- 3b,6a,6b,7-tetrahydro-1*H*-dipyrrolo[3,4-a:3,4-c]carbazole-1,3,4,6-(2*H*,3a*H*,5*H*)-tetrone ;

- 5-ethyl-3b,6a,6b,7-tetrahydro-1*H*-dipyrrolo[3,4-a:3,4-c]carbazole-1,3,4,6-(2*H*,3a*H*,5*H*)-tetrone ;
- 3b,6a,7,11c-tetrahydro-1*H*-dipyrrolo[3,4-a:3,4-c]carbazole-1,3,4,6-(2*H*,3a*H*,5*H*)-tetrone ;
- 5 - 3b,6a,6b,7-tetrahydrofuro[3,4-a]pyrrolo[3,4-c]carbazole-1,3,4,6-(2*H*,3a*H*,5*H*)-tetrone ;

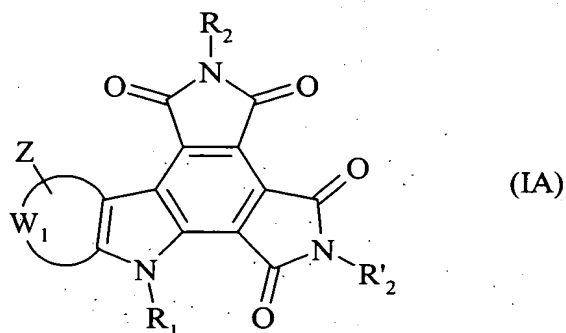
wherein aryl is understood to mean a phenyl, naphthyl, dihydronaphthyl, tetrahydronaphthyl, indenyl or indanyl group, each of those groups optionally being substituted by one or more identical or different groups selected from halogen, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl, linear or branched (C<sub>1</sub>-C<sub>6</sub>)trihaloalkyl, hydroxy, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkoxy, and NR<sub>3</sub>R<sub>4</sub>, R<sub>3</sub> and R<sub>4</sub> being as defined hereinbefore.

2- A compound of claim 1, wherein X<sub>1</sub> and Y<sub>1</sub>, with carbon carrying them, together form carbonyl, X<sub>2</sub> and Y<sub>2</sub>, with carbon carrying them, together form carbonyl, X'<sub>1</sub> and Y'<sub>1</sub>, with carbon carrying them, together form carbonyl and X'<sub>2</sub> and Y'<sub>2</sub>, with carbon carrying them, together form carbonyl.

15 3- A compound of claim 1 wherein Q<sub>1</sub> represents -NR<sub>2</sub> wherein R<sub>2</sub> is as defined for formula (I).

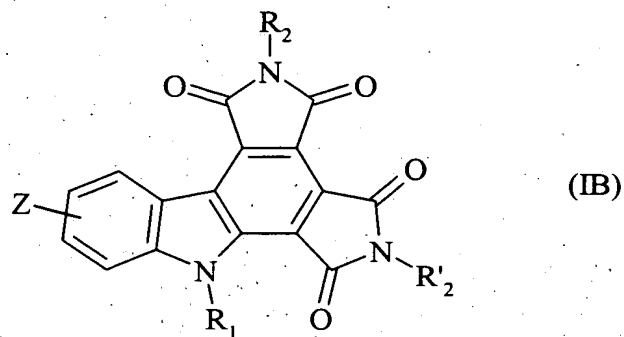
4- A compound of claim 1 wherein Q<sub>2</sub> represents -NR'<sub>2</sub> wherein R'<sub>2</sub> is as defined for formula (I).

5- A compound of claim 1 which is a compound of formula (IA) :



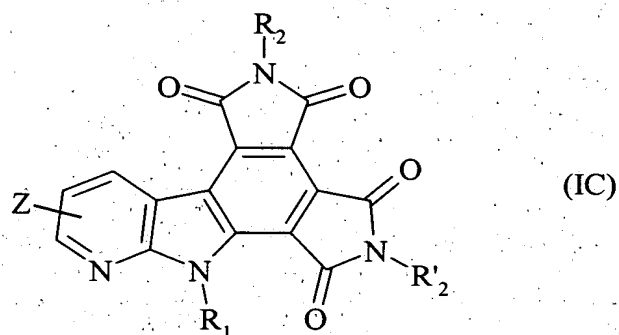
20 wherein R<sub>1</sub>, R<sub>2</sub>, R'<sub>2</sub>, W<sub>1</sub> and Z are as defined for formula (I).

6- A compound of claim 1 which is a compound of formula (IB) :



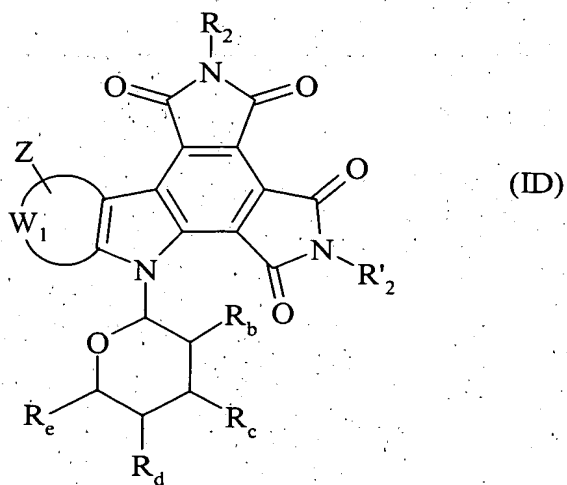
wherein  $R_1$ ,  $R_2$ ,  $R'_2$  and  $Z$  are as defined for formula (I).

7- A compound of claim 1 which is a compound of formula (IC) :



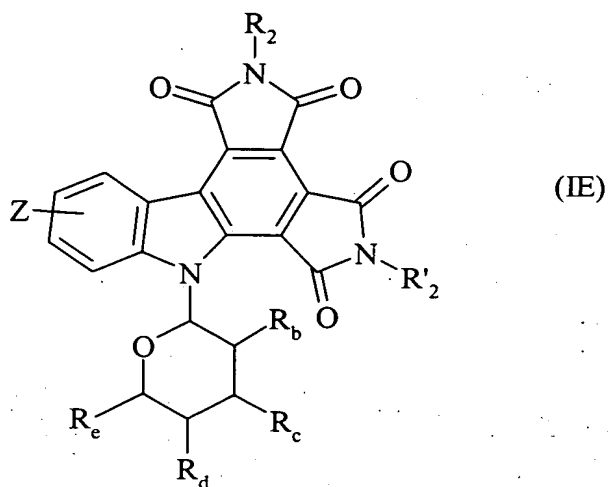
wherein  $R_1$ ,  $R_2$ ,  $R'_2$  and  $Z$  are as defined for formula (I).

8- A compound of claim 1 which is a compound of formula (ID) :



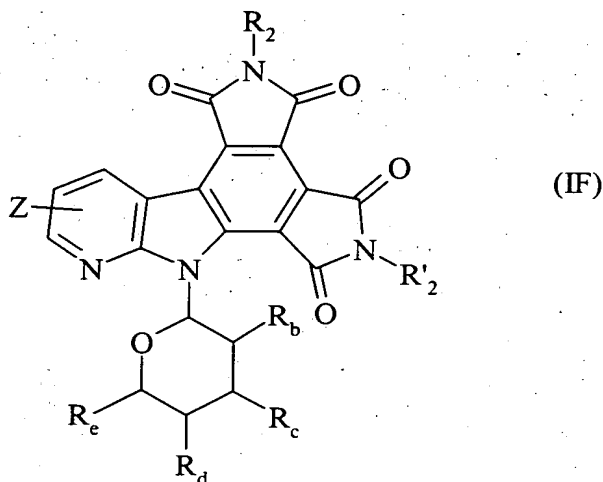
wherein  $R_2$ ,  $R'_2$ ,  $W_1$ ,  $Z$ ,  $R_b$ ,  $R_c$ ,  $R_d$  and  $R_e$  are as defined for formula (I).

9- A compound of claim 1 which is a compound of formula (IE) :



wherein  $R_2$ ,  $R'_2$ ,  $Z$ ,  $R_b$ ,  $R_c$ ,  $R_d$  and  $R_e$  are as defined for formula (I).

**10-** A compound of claim 1 which is a compound of formula (IF) :



5 wherein  $R_2$ ,  $R'_2$ ,  $Z$ ,  $R_b$ ,  $R_c$ ,  $R_d$  and  $R_e$  are as defined for formula (I).

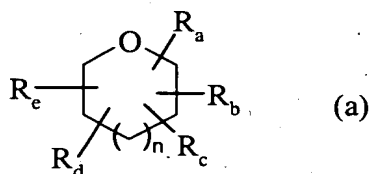
**11-** A compound of claim 1 wherein  $Z$  represents a group of formula U-V wherein U represents single bond and V represents a group selected from hydrogen, halogen, nitro, linear or branched  $(C_1-C_6)$ alkyl, hydroxy, linear or branched  $(C_1-C_6)$ alkoxy, aryl- $(C_1-C_6)$ alkoxy in which the alkoxy moiety may be linear or branched,  $NR_3R_4$  wherein  $R_3$  and  $R_4$  each represents a hydrogen atom.

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**12-** A compound of claim 1 wherein  $Z$  represents a group of formula U-V wherein U represents single bond and V represents a group selected from hydrogen, halogen, hydroxy,

aryl-(C<sub>1</sub>-C<sub>6</sub>)alkoxy in which the alkoxy moiety may be linear or branched.

13-A compound of claim 1 wherein R<sub>1</sub> represents hydrogen, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl or a group of formula (a) :



5 bonded to the nitrogen atom by R<sub>a</sub>,  
wherein :

- R<sub>b</sub>, R<sub>c</sub>, and R<sub>d</sub> represent hydroxy, aryl-(C<sub>1</sub>-C<sub>6</sub>)alkoxy in which the alkoxy moiety may be linear or branched, -O-C(O)-R<sub>5</sub> wherein R<sub>5</sub> represents linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl,
- R<sub>e</sub> represents a group of formula U<sub>1</sub>-R<sub>a</sub> wherein U<sub>1</sub> represents methylene and R<sub>a</sub> has the same definitions as R<sub>b</sub>, R<sub>c</sub> and R<sub>d</sub> and n is 0,

14-A compound of claim 1 wherein R<sub>1</sub> represents hydrogen.

15-A compound of claim 1 wherein R<sub>2</sub> represents hydrogen, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl, OR<sub>3</sub>, NR<sub>3</sub>R<sub>4</sub>, or linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkylene substituted by OR<sub>3</sub>, NR<sub>3</sub>R<sub>4</sub> wherein R<sub>3</sub> and R<sub>4</sub> are as defined for formula (I).

16- A compound of claim 1 wherein R<sub>2</sub> represents hydrogen, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkylene substituted by NR<sub>3</sub>R<sub>4</sub> wherein R<sub>3</sub> and R<sub>4</sub> are as defined for formula I.

17- A compound of claim 1 wherein R'<sub>2</sub> represents hydrogen, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkylene substituted by NR<sub>3</sub>R<sub>4</sub> wherein R<sub>3</sub> and R<sub>4</sub> are as defined for formula (I).

18- A compound of claim 1 which is selected from :



- 1*H*-dipyrrolo[3,4-*a*:3,4-*c*]carbazole-1,3,4,6(2*H*,5*H*,7*H*)-tetrone,
- 2-methyl-1*H*-dipyrrolo[3,4-*a*:3,4-*c*]carbazole-1,3,4,6(2*H*,5*H*,7*H*)-tetrone,
- 2,5-dimethyl-1*H*-dipyrrolo[3,4-*a*:3,4-*c*]carbazole-1,3,4,6(2*H*,5*H*,7*H*)-tetrone,
- 2-[2-(diethylamino)ethyl]-5-methyl-1*H*-dipyrrolo[3,4-*a*:3,4-*c*]carbazole-  
5 1,3,4,6(2*H*,5*H*,7*H*)-tetrone,
- 10-hydroxy-1*H*-dipyrrolo[3,4-*a*:3,4-*c*]carbazole-1,3,4,6(2*H*,5*H*,7*H*)-tetrone,

**19**- A method for treating a living body afflicted with cancer comprising the step of administering to the living body an amount of a compound of claim 1, which is effective for alleviation of said cancer

10 **20**- A pharmaceutical composition useful in treating cancer comprising as active principle an effective amount of a compound as claimed in claim 1, together with one or more pharmaceutically acceptable excipients or vehicles.